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Figure 1

Pol activity and Exo activity in %

	WT	Y387F	Y387W	Y387H	Y387N	Y387S	G389A
Pol	100	160	92	93,6	6,4	17,8	10,7
Exo	100	90	71	98	205	187	236
Pol/Exo	1	1,77	1,29	0,96	0,03	0,09	0,04

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Figure 2

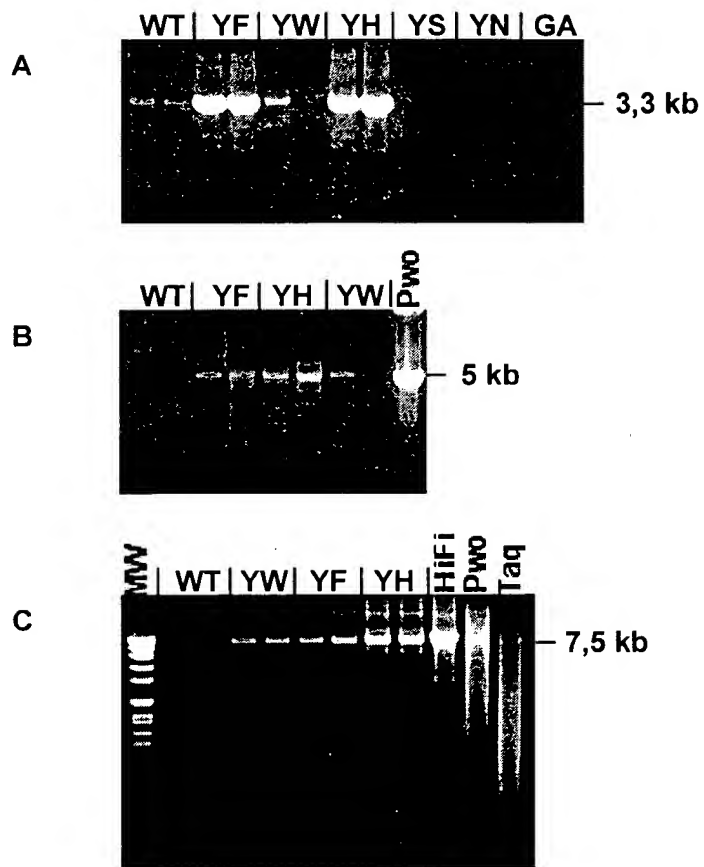


Figure 3

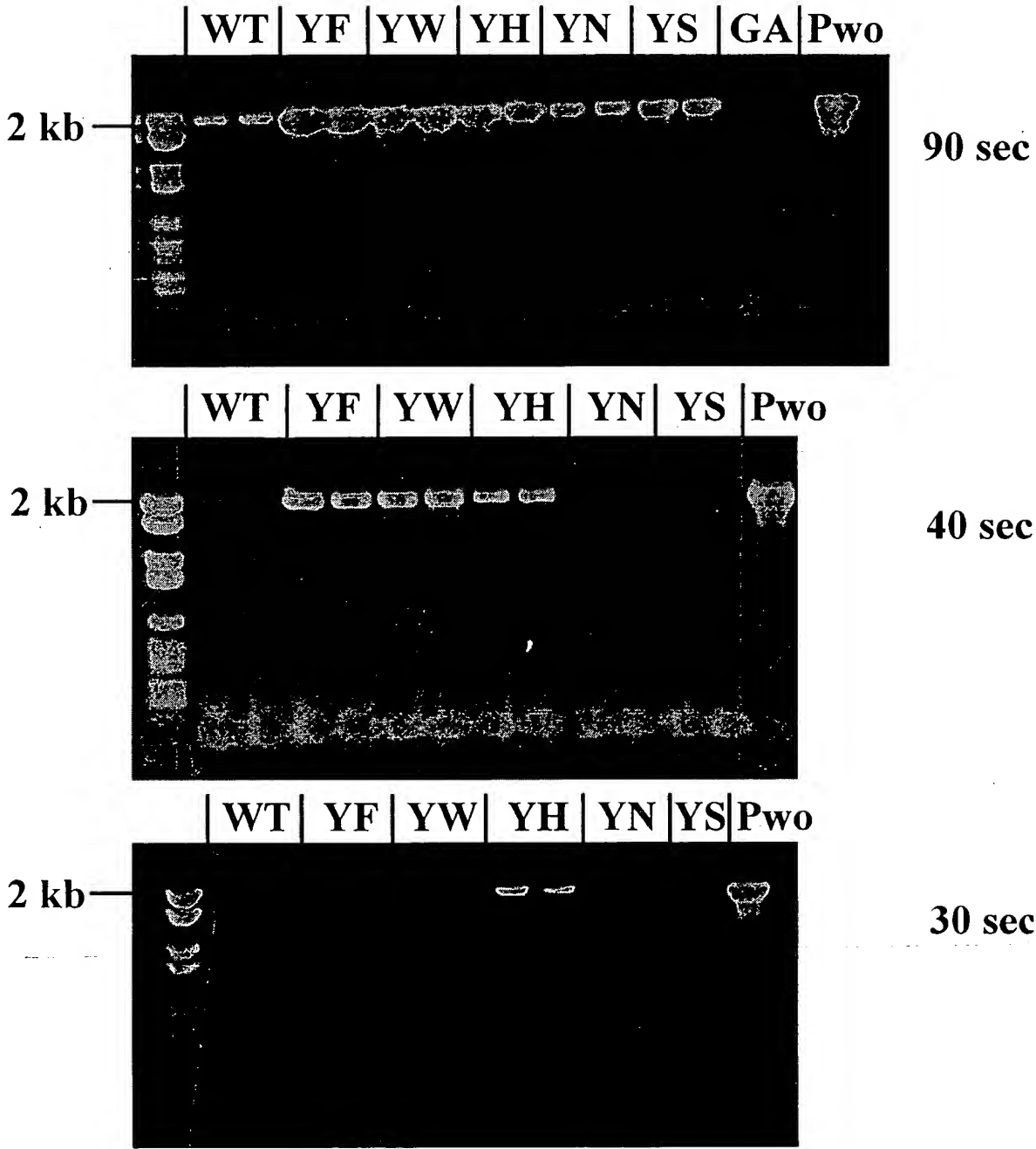


Figure 4

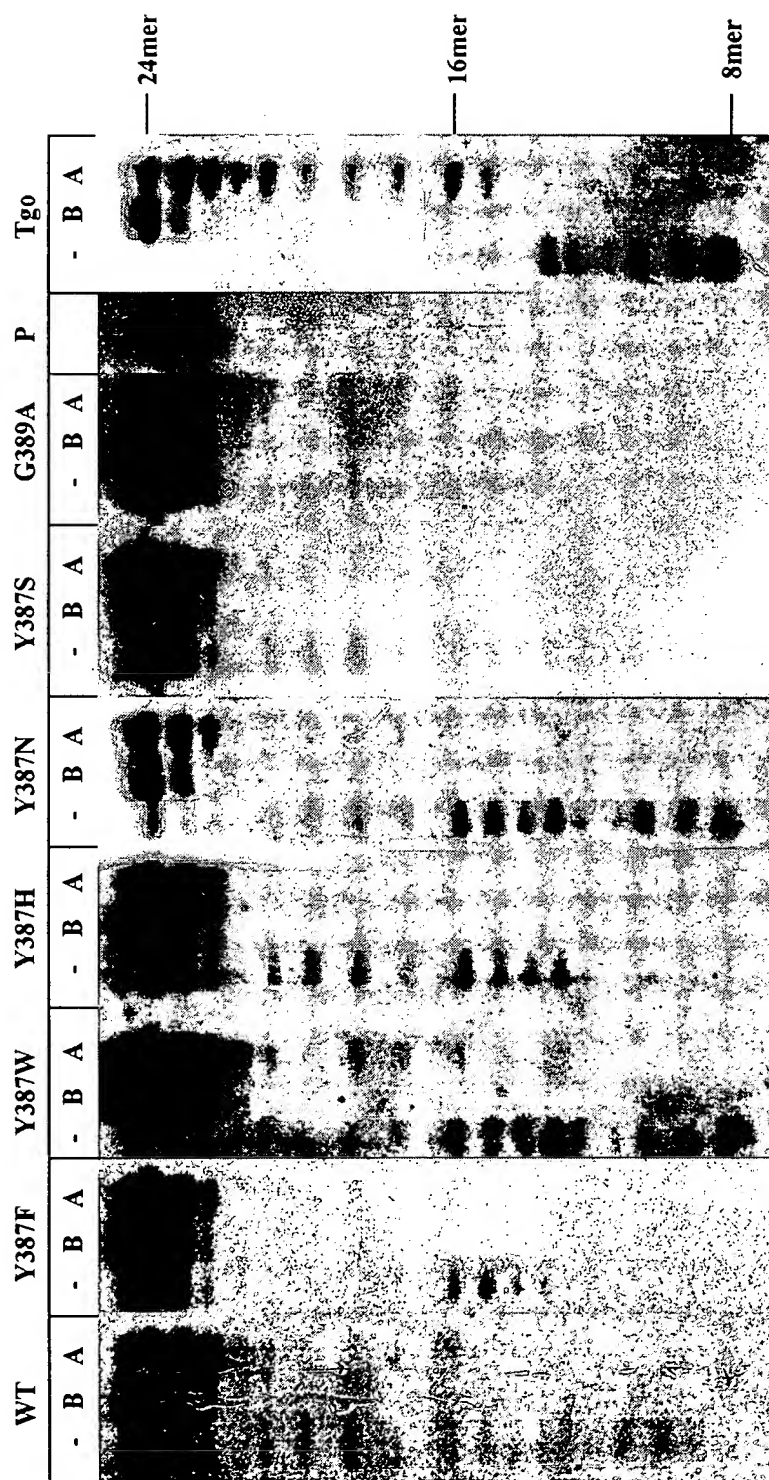
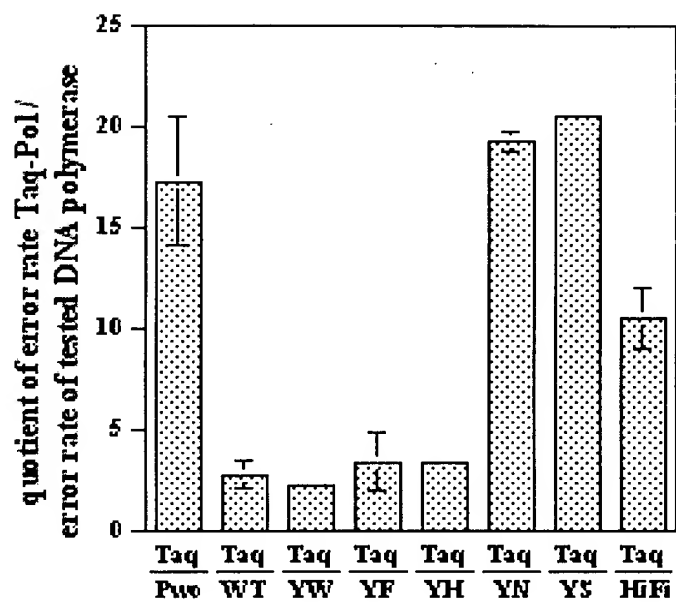


Figure 5

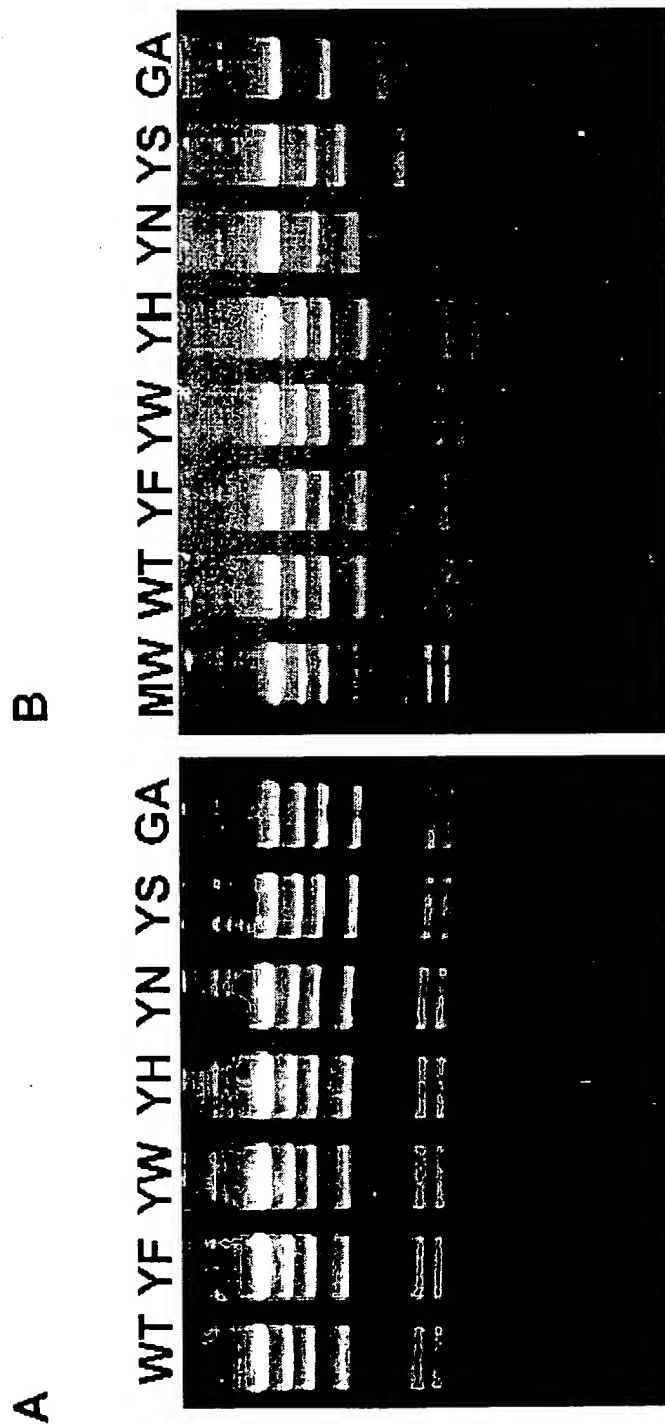


SDS-PAGE gel showing protein expression for WT and YF variants. Molecular weight markers (114, 97, 66, 45, 21, 14 kDa) are on the left. Lanes are labeled MW, WT, YF, YW, GA, YS, YN, and YH. The YF lane shows a prominent band at approximately 97 kDa, while other lanes show bands at various molecular weights.

$\frac{d}{dt} \left( \frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450
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Figure 7





	E	R	R	R		G (Y)	K	E	E	L	W	E	consensus														
T. aggregans	E	Y	R	R	L	R	T	T	Y	L	G	G	Y	V	K	E	P	E	R	G	L	W	E	N			
T. litoralis	E	Y	K	R	R	L	R	T	T	Y	L	G	G	Y	V	K	E	P	E	R	G	L	W	E	N		
T. fumicidans	E	E	L	E	R	R	-	R	G	G	Y	A	G	G	Y	V	K	E	P	E	R	G	L	W	E	N	
T. spec. 9N7	E	E	L	A	R	R	-	R	E	S	Y	A	G	G	Y	V	K	E	P	E	R	G	L	W	E	N	
T. gorgonarius	E	E	L	A	R	R	-	R	E	S	Y	E	G	G	Y	V	K	E	P	E	R	G	L	W	E	N	
P. spec. KOD	E	E	L	A	R	R	-	R	E	S	Y	E	G	G	Y	V	K	E	P	E	R	G	L	W	E	N	
P. abyssii	E	E	Y	E	R	R	L	R	E	S	Y	E	G	G	Y	V	K	E	P	E	R	G	L	W	E	N	
P. furiosus	E	E	Y	E	R	R	L	R	E	S	Y	E	G	G	Y	V	K	E	P	E	R	G	L	W	E	N	
P. horikoshii	E	E	Y	E	R	R	L	R	E	S	Y	E	G	G	Y	V	K	E	P	E	R	G	L	W	E	N	
M. jannaschii	E	Y	R	R	B	V	L	T	T	Y	E	G	G	Y	V	K	E	P	E	R	G	L	W	E	N		
M. voltae	S	Y	R	E	R	A	K	F	S	Y	E	G	G	Y	V	H	E	P	L	K	G	I	Q	E	N		
S. solfataricus	T	S	A	L	I	K	G	K	G	Y	K	G	A	V	V	I	D	P	P	A	G	I	F	F	N		
S. acidocaldarius	T	A	A	V	I	K	G	K	K	Y	K	G	A	V	V	I	D	P	P	A	G	I	F	F	N		
P. islandicum	T	K	A	I	I	K	G	K	K	Y	A	G	A	V	V	L	D	P	P	L	G	I	F	F	N		
P. occultum	S	E	A	L	I	K	G	K	K	Y	Q	G	A	L	V	L	D	P	P	S	G	I	F	F	N		
A. pernix	V	G	A	I	I	K	D	K	K	Y	R	G	A	I	V	L	D	P	P	V	G	I	F	F	N		
S. chwalkuensis	T	A	A	I	S	K	G	K	R	Y	K	G	A	V	V	I	D	P	P	A	G	I	F	F	N		

Euryarchaea

Crenarchaea

- SEQ. ID. NO: 16  
 SEQ. ID. NO: 17  
 SEQ. ID. NO: 18  
 SEQ. ID. NO: 19  
 SEQ. ID. NO: 20  
 SEQ. ID. NO: 21  
 SEQ. ID. NO: 22  
 SEQ. ID. NO: 23  
 SEQ. ID. NO: 24  
 SEQ. ID. NO: 25  
 SEQ. ID. NO: 26  
 SEQ. ID. NO: 27  
 SEQ. ID. NO: 28  
 SEQ. ID. NO: 29  
 SEQ. ID. NO: 30  
 SEQ. ID. NO: 31  
 SEQ. ID. NO: 32

Figure 8

Figure 9/1

SEQ. ID. NO: 33

SEQ. ID. NO: 34

1/1

ATG ATA TTT GAC ACT GAC TAC ATA ACA AAG GAC GGT AAA CCC ATA ATT CGA ATT TTC AAG  
Met ile phe asp thr asp tyr ile thr lys asp gly lys pro ile ile arg ile phe lys

61/21

AAA GAG AAC GGG GAA TTT AAA ATA GAA CTT GAT CCA CAT TTT CAG CCC TAC ATT TAC GCT  
lys glu asn gly glu phe lys ile glu leu asp pro his phe gln pro tyr ile tyr ala

121/41

CTT CTC AAA GAT GAC TCC GCT ATT GAT GAA ATA AAA GCA ATA AAA GGC GAG AGA CAC GGA  
leu leu lys asp asp ser ala ile asp glu ile lys ala ile lys gly glu arg his gly

181/61

AAA ATT GTG AGA GTA GTC GAT GCA GTG AAA GTC AAG AAG AAA TTT TTG GGG AGA GAT GTT  
lys ile val arg val val asp ala val lys val lys lys lys phe leu gly arg asp val

241/81

GAG GTC TGG AAG CTT ATA TTT GAG CAT CCC CAA GAC GTC CCG GCC CTA AGG GGC AAG ATA  
glu val trp lys leu ile phe glu his pro gln asp val pro ala leu arg gly lys ile

301/101

AGG GAA CAT CCA GCT GTG ATT GAC ATT TAT GAG TAC GAC ATA CCC TTT GCC AAG CGC TAC  
arg glu his pro ala val ile asp ile tyr glu tyr asp ile pro phe ala lys arg tyr

361/121

CTC ATA GAC AAG GGC TTG ATC CCT ATG GAG GGC GAC GAG GAG CTT AAG CTA ATG GCC TTC  
leu ile asp lys gly leu ile pro met glu gly asp glu glu leu lys leu met ala phe

421/141

GAC ATT GAG ACG TTT TAC CAC GAG GGA GAC GAG TTT GGG AAG GGC GAG ATA ATA ATG ATA  
asp ile glu thr phe tyr his glu gly asp glu phe gly lys gly glu ile ile met ile

481/161

AGC TAC GCC GAT GAG GAA GAG GCA AGG GTA ATT ACA TGG AAG AAT ATT GAT CTG CCC TAC  
ser tyr ala asp glu glu glu ala arg val ile thr trp lys asn ile asp leu pro tyr

541/181

GTT GAT GTT GTA TCC AAC GAA AGG GAG ATG ATA AAG CGG TTT GTG CAA ATT GTC AGG GAA  
val asp val val ser asn glu arg glu met ile lys arg phe val gln ile val arg glu

601/201

AAA GAC CCG GAT GTC CTG ATA ACT TAC AAT GGA GAC AAC TTT GAT TTG CCG TAC CTT ATA  
lys asp pro asp val leu ile thr tyr asn gly asp asn phe asp leu pro tyr leu ile

661/221

AAA AGG GCA GAG AAG TTA GGA GTT ACT CTT CTC TTG GGG AGG GAC AAA GAA CAC CCC GAG  
lys arg ala glu lys leu gly val thr leu leu leu gly arg asp lys glu his pro glu

721/241

CCC AAG ATT CAC AGA ATG GGC GAT AGC TTT GCC GTG GAA ATT AAA GGC AGA ATT CAC TTT  
pro lys ile his arg met gly asp ser phe ala val glu ile lys gly arg ile his phe

781/261

GAT CTC TTC CCG GTT GTG CGG AGA ACC ATA AAC CTC CCA ACA TAC ACG CTT GAG GCA GTT  
asp leu phe pro val val arg arg thr ile asn leu pro thr tyr thr leu glu ala val

841/281

TAT GAA GCC GTC TTG GGA AAA ACC AAA AGC AAG CTG GGT GCG GAG GAA ATC GCC GCC ATC  
tyr glu ala val leu gly lys thr lys ser lys leu gly ala glu glu ile ala ala ile

901/301

TGG GAA ACA GAG GAG AGC ATG AAG AAG CTG GCC CAG TAC TCG ATG GAA GAT GCT AGG GCA  
trp glu thr glu glu ser met lys lys leu ala gln tyr ser met glu asp ala arg ala

961/321

ACT TAT GAA CTC GGA AAA GAG TTT TTC CCC ATG GAG GCA GAG CTA GCA AAG CTA ATA GGC  
thr tyr glu leu gly lys glu phe phe pro met glu ala glu leu ala lys leu ile gly

1021/341

CAA AGC GTA TGG GAC GTC TCA AGA TCA AGC ACT GGC AAC CTT GTA GAG TGG TAC CTG TTA  
gln ser val trp asp val ser arg ser ser thr gly asn leu val glu trp tyr leu leu

1081/361

1081/361

Figure 9/2

SEQ. ID. NO: 33

SEQ. ID. NO: 34

AGG GTG GCA TAT GAG AGG AAT GAG CTC GCT CCG AAC AAG CCG GAT GAA GAA GAG TAC AGA  
arg val ala tyr glu arg asn glu leu ala pro asn lys pro asp glu glu glu tyr arg  
1141/381

AGG CGT TTA AGG ACT ACT TAC CTG GGA GGA TAC GTA AAA GAG CCG GAA AGA GGC TTA TGG  
arg arg leu arg thr thr tyr leu gly gly tyr val lys glu pro glu arg gly leu trp  
1201/401

GAG AAC ATC ACC TAT TTA GAC TTT AGG TGC CTA TAC CCC TCA ATT ATA GTT ACC CAC AAC  
glu asn ile thr tyr leu asp phe arg cys leu tyr pro ser ile ile val thr his asn  
1261/421

GTC TCC CCT GAC ACT TTA GAA AGA GAA GGC TGC AAG AAT TAC GAT GTT GCC CCG ATA GTA  
val ser pro asp thr leu glu arg glu gly cys lys asn tyr asp val ala pro ile val  
1321/441

GGT TAT AAG TTC TGC AAG GAT TTT CCC GGT TTC ATT CCA TCT ATA CTC GGG GAA TTA ATC  
gly tyr lys phe cys lys asp phe pro gly phe ile pro ser ile leu gly glu leu ile  
1381/461

ACA ATG AGG CAA GAA ATA AAG AAG AAG ATG AAA GCT ACA ATT GAC CCA ATA GAA AAG AAA  
thr met arg gln glu ile lys lys lys met lys ala thr ile asp pro ile glu lys lys  
1441/481

ATG CTT GAT TAT AGG CAA AGA GCT GTT AAA TTG CAC GCA AAC AGC TAT TAC GGT TAT ATG  
met leu asp tyr arg gln arg ala val lys leu his ala asn ser tyr tyr gly tyr met  
1501/501

GGC TAT CCC AAG GCG AGG TGG TAC TCG AAG GAA TGT GCC GAA AGC GTT ACC GCG TGG GGA  
gly tyr pro lys ala arg trp tyr ser lys glu cys ala glu ser val thr ala trp gly  
1561/521

AGG CAC TAC ATA GAA ATG ACC ATA AAA GAG ATA GAG GAG AAA TTT GGA TTT AAG GTG CTA  
arg his tyr ile glu met thr ile lys glu ile glu glu lys phe gly phe lys val leu  
1621/541

TAT GCC GAC ACT GAT GGT TTT TAC GCC ACA ATA CCG GGA GAA AAA CCT GAA ACA ATC AAA  
tyr ala asp thr asp gly phe tyr ala thr ile pro gly glu lys pro glu thr ile lys  
1681/561

AAG AAA GCT AAG GAA TTC TTA AAA TAC ATA AAC TCC AAA CTT CCC GGT CTG CTC GAG CTT  
lys lys ala lys glu phe leu lys tyr ile asn ser lys leu pro gly leu leu glu leu  
1741/581

GAG TAT GAG GGC TTT TAC TTG AGA GGA TTT TTC GTC GCA AAG AAG CGC TAT GCG GTT ATA  
glu tyr glu gly phe tyr leu arg gly phe phe val ala lys lys arg tyr ala val ile  
1801/601

GAC GAA GAA GGT AGG ATA ACG ACA AGG GGT CTG GAA GTT GTA AGG AGG GAC TGG AGC GAA  
asp glu glu gly arg ile thr thr arg gly leu glu val val arg arg asp trp ser glu  
1861/621

ATA GCC AAA GAG ACC CAG GCT AAA GTC TTG GAG GCA ATA CTT AAA GAA GAT AGT GTC GAA  
ile ala lys glu thr gln ala lys val leu glu ala ile leu lys glu asp ser val glu  
1921/641

AAA GCT GTG GAA ATC GTT AAG GAC GTT GTT GAG GAG ATA GCA AAA TAC CAA GTC CCG CTT  
lys ala val glu ile val lys asp val val glu glu ile ala lys tyr gln val pro leu  
1981/661

GAA AAG CTT GTT ATC CAC GAG CAG ATT ACC AAG GAT CTA AGT GAA TAC AAA GCC ATT GGG  
glu lys leu val ile his glu gln ile thr lys asp leu ser glu tyr lys ala ile gly  
2041/681

CCT CAT GTA GCA ATA GCA AAG AGG CTT GCT GCA AAG GGA ATA AAA GTG AGA CCC GGC ACG  
pro his val ala ile ala lys arg leu ala ala lys gly ile lys val arg pro gly thr  
2101/701

ATA ATA AGC TAT ATC GTC CTC AGG GGA AGC GGA AAG ATA AGT GAC AGG GTA ATT TTG CTT  
ile ile ser tyr ile val leu arg gly ser gly lys ile ser asp arg val ile leu leu  
2161/721

Figure 9/3

SEQ. ID. NO: 33

SEQ. ID. NO: 34

TCA GAG TAT GAT CCG AAA AAA CAC AAG TAC GAC CCC GAC TAC TAC ATA GAA AAC CAA GTT  
ser glu tyr asp pro lys lys his lys tyr asp pro asp tyr tyr ile glu asn gln val  
2221/741

CTG CCG GCG GTG CTT AGG ATC CTT GAA GCC TTC GGC TAC AGA AAA GAG GAC TTA AAA TAC  
leu pro ala val leu arg ile leu glu ala phe gly tyr arg lys glu asp leu lys tyr  
2281/761

CAA AGC TCA AAA CAG GTT GGA CTG GAC GCG TGG CTT AAG AAG TAG  
gln ser ser lys gln val gly leu asp ala trp leu lys lys AMB

2221/741